Survival Factors Factual in Support of the General Aviation Airbag Study

May 11, 2010

Location: Owyhee, Oregon
Aircraft Type: Husky A-1B
Accident Date: 8/27/2006
Accident Time: 1326 PDT
Accident Number: SEA06FA168
Airbag Equipped: yes

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On August 27, 2006, about 1326 Pacific daylight time, an Aviat Aircraft, Inc, Husky A-1B, N94HY, sustained substantial damage during landing at the Owyhee State Reservoir Airport, Owyhee, Oregon. The private pilot/registered owner of the airplane was the sole occupant and received minor injuries during the accident sequence. The flight had originated at Ontario, Oregon, approximately 30 minutes prior to the accident.

In a written report submitted to the NTSB, the pilot stated he had completed 3-4 “water ski” runs (a maneuver accomplished by setting the aircraft's parking brake, touching down on the water, and skiing on the main landing gear tires) on the reservoir and was transitioning to the airport for a full-stop landing. The pilot stated that after he completed the maneuvers, he climbed to 1,000 feet AGL and entered a left downwind for the intended runway. He stated that when the airplane touched down (wheel landing[1] approximately 43 miles per hour [mph]) he felt the right main tire drag and attributed it to the soft runway condition.[2] He reported that the airplane skidded down the runway and when the left main tire touched down, the airplane's tail "came up" and the airplane nosed over. The pilot estimated that when the airplane nosed over, it was travelling at approximately 5 knots (5.8 mph).

[1] A wheel landing involves landing on the two front (left and right main) wheels before the rear/tail wheel touches down.

[2] The airplane had “tundra tires”, which are approximately 4 times larger than normal tires and may affect ground handling and braking.

The airplane came to rest inverted on the dirt/sod runway. The pilot stated the airplane's parking brake was engaged prior to the water ski maneuver; however, he failed to release it after completing the maneuver and inadvertently landed with the brake set. After the crash, the pilot exited through the airplane door. The restraint-mounted airbags did not deploy.

There was substantial damage to the airplane, shown in figure 1, including a bent propeller, dented spinner and engine cowling, damage to the leading edge of the left wing, bent right wing ribs, bent right wing strut, and deformation of the vertical stabilizer and rudder. The forward windscreen was broken and the forward left diagonal post (A-pillar) was compressed outboard and downward about 3 inches (see figure 2), and the roof of the cockpit had minor deformation of approximately one inch. There was a black smudge on the metal support tube that was located directly above the occupant's head and the tube was compressed upward approximately 1/16 inch. There was no damage to the instrument panel.

Figure 1. A photograph showing the wreckage of Aviat Aircraft Inc. Husky A-1B, N94HY that crashed in Owyhee, Oregon (SEA06FA168) (The wings were removed post-crash during the recovery of the aircraft)

Figure 2. A photograph showing the bent A-pillar and broken windscreen of the Aviat Aircraft Inc. Husky A-1B, N94HY that crashed in Owyhee, Oregon (SEA06FA168)

Both the forward and aft seats were intact and undamaged. The airplane had airbag-equipped 5-point restraint systems with lift latch buckles on both seats. The restraint system in the front seat had “load marks”, or indentations in the seatbelt webbing from the buckle that suggested the restraint was being used at the time of the crash. The restraint systems were undamaged and neither the pilot’s airbag nor the unoccupied rear seat restraint airbag deployed during the accident sequence. Examination of both systems revealed that the inflator, the cable harness to the buckle switch, and the gas inflator hose were all connected. Two electronics module assemblies (EMA) were present, one for the front seat and another for the rear seat.[3] The EMA, inflator assembly, squib connectors and associated lines were intact and no damage was noted.

An AmSafe-designed System Diagnostic Tool (SDT) was used to check the functional status of the airbag system. The system check, which was conducted by the investigator in charge, was completed and no system anomalies were noted. Additional testing and evaluation of the EMA was completed at AmSafe's manufacturing facility in Phoenix, Arizona, under the supervision of a representative from the FAA's Manufacturing Inspection District Office. The circuitry, trigger timing and overall condition of the unit was evaluated, and according to the post examination report (addendum) "no anomalies were found and the unit performed as designed."

[3] The EMA is the crash sensor which triggers airbag deployment when a certain threshold is met.

The pilot was seated in the front seat (figure 3). He was 6 feet 1 inch tall, 180 pounds and 61 years old. Initially, the pilot did not document any injuries in a written report. However, during a subsequent interview, the pilot reported that he experienced a minor laceration and bruising to his head, which did not require stitches. The pilot stated the clearance between his head and the ceiling of the cockpit is about 4.5 inches. The pilot self-reported that he was cut by his headset when his head impacted the ceiling of the airplane during the crash. He further commented that the mechanism of his head injury was probably the overhead light assembly and associated cross member/brace. A black smudge on the support beam above the pilot's head also indicated possible transfer of material from the headset during the accident.

The pilot also reported sustaining bruises on his right hip and left shin He stated that, sitting in a normal position, his shins are about 1.5 inches aft of the lower instrument panel; he believed that was the mechanism for his shin injury.

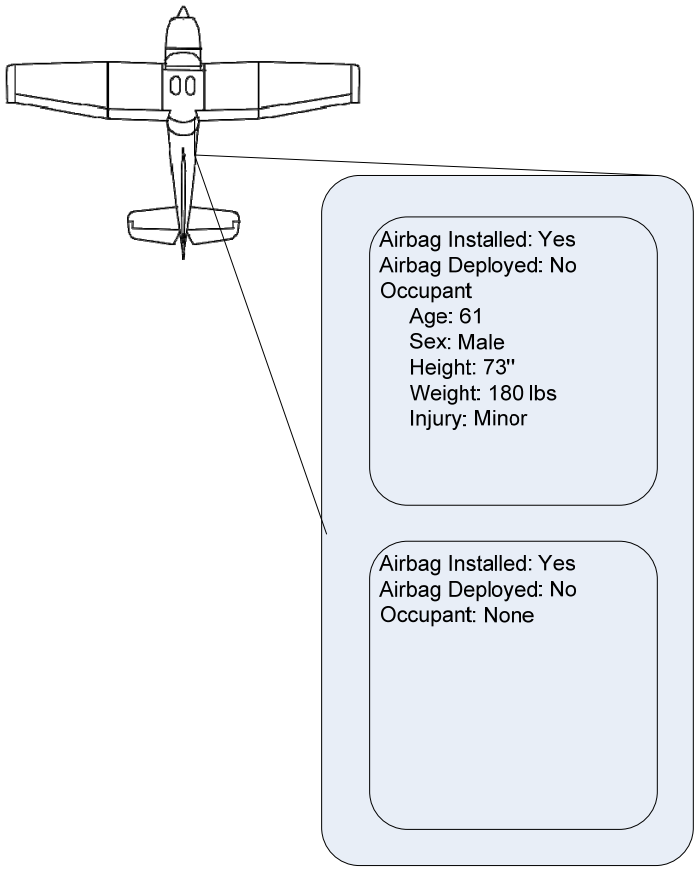

Figure 3. The seating configuration for the Aviat Husky A-1B, with information about the accident pilot.